Natural parasitisation of *Spodoptera litura* F. (Lepidoptera: Noctuidae) by *Zele chloropthalma* Nees (Hymenoptera: Braconidae) in vegetable ecosystems of Kashmir Valley, India

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Abstract

The present paper reports the occurrence of *Zele chloropthalma* Nees as a parasitoid of lepidopteran pest *Spodoptera litura* F. for the first time from Kashmir Valley. Observations have been made on the seasonal abundance and the extent of paraitisation of *S. litura* by *Z. choloropthalma* in various vegetable ecosytsms of Kahmir. The highest extent of parasitisation was observed to be 9.75%.

Keywords: Parasitoid, *Spodoptera, Zele chloropthalma*, Kashmir

Introduction

Some species of genus *Spodoptera* (Lepidoptera: Noctuidae) such as *Spodoptera exigua* (Hubner) and *S. litura* (Fabricius) are reported as minor pests of vegetable crops in India (Nair, 1970; Butani and Jotwani, 1984; Capinera, 2001). Several parasitoids have been reported to parasitize *S. litura* on various host plants in different regions of the world (Rao and Satyanarayana, 1984 in India and Hassanein *et al.*, 1985 in Egypt). However, there is no systematic report of any parasitoid of *S. litura* from Kashmir Valley. In the present investigation natural parasitisation of *S. litura* has been reported and the extent of parasitisation recorded.

Materials and Methods

To record the parasitoids of *S. litura* and other pests, field surveys were undertaken in the prevailing agroclimatic conditions, during the years from 2005 to 2008, covering various vegetable ecosystems across 6 districts of Kashmir Valley *viz.*, Anantnag, Badgam, Baramulla, Ganderbal, Pulwama and Srinagar. Weekly collection of the larvae of *S. litura* was made from several sites selected in these districts. The larvae were reared in the laboratory until the emergence of parasites or adult pest. The parasites emerged were properly preserved and the identification of parasitoid, *Zele choloropthalma* (Hymenoptera: Braconidae) was done according to Achterberg (1979) and Wharton *et al.* (1997).

Results and Discussion

In the present survey, the larvae of *S. litura* were found attacking several vegetable cole crops *viz.* cabbage, cauliflower, knoll-khol and kale. In general, the attack of lepidopteron pest, *S. litura* was witnessed during the months from May to August in each study year. Given the maximum number of larvae recorded (Table 1), the highest extent of infestation was observed during the months of June and July. Kale and knoll-khol were most severely attacked. The larvae after rearing were found to be parasitized by a hymenopteran parasitod, *Zele chloropthalma* Nees (Hymenoptera: Braconidae). The present reporting of *Z. chloropthalma* Nees as a parasite of *S. litura* is the first record from Kashmir (India).

Obtained data indicate that, the parasitisation of *S. litura* by *Z. chloropthalma* is mostly observed during the months of June and July. In the year 2005, a total of 174 larvae were collected from the selected sites, out of which, 7 larvae were found parasitized, and hence, the percentage of parasitism was 4.02%. The highest extent of parsitisation in this year was recorded to be 8.33% in the last week of June.

In the year 2006, a total of 184 larvae were collected from the selected sites, out of which, 7 larvae were found parasitized, and hence, the percentage of parasitism was 3.80%. The highest extent of parsitisation in this year was recorded to be 7.69% % in the last

week of June.

In the year 2007, a total of 167 larvae were collected from the selected sites, out of which, 10 larvae were found parasitized, and hence, the percentage of parasitism was 5.98%. The highest extent of parsitisation in this year was recorded to be 9.09% in the in the 3rd and 4th week of June.

In the year 2008, a total of 177 larvae were collected from the selected sites, out of which, 9 larvae were found parasitized, and hence, the percentage of parasitism was 5.08%. The highest extent of parsitisation in this year was recorded to be 9.75% in the last week of June.

Table-1: Weekly number of *S. litura* and its Hymenopteran parasitoid, *Z. chloropthalma* recorded in vegetable ecosystems during 2005-2006 survey in Kashmir (India).

Month /Week	No. of *S. litura* collected				No. of larvae parasitized by *Z. chloropthalma*				%age parasitism			
	2005	2006	2007	2008	2005	2006	2007	2008	2005	2006	2007	2008
May												
I week	0	0	0	0	0	0	0	0	0	0	0	0
II week	0	0	0	0	0	0	0	0	0	0	0	0
III	2	0	0	2	0	0	0	0	0	0	0	0
IV	3	4	0	0	0	0	0	0	0	0	0	0
June												
I	9	6	5	11	0	0	0	0	0	0	0	0
II	8	16	10	14	0	0	0	1	0	0	0	7.14
III	26	24	22	20	1	0	2	1	3.84	0	9.09	5.0
IV	36	39	44	41	3	3	4	4	8.33	7.69	9.09	9.75
July												
I	32	35	34	29	2	2	3	2	6.25	5.71	8.82	6.89
II	22	24	15	20	1	1	0	1	4.54	4.16	0	5.0
III	12	15	20	14	0	0	1	0	0	0	5.0	0
IV	13	9	11	9	0	0	0	0	0	0	0	0
August												
I	9	7	5	11	0	0	0	0	0	0	0	0
II	2	4	1	6	0	0	0	0	0	0	0	0
III	0	0	0	0	0	0	0	0	0	0	0	0
IV	0	0	0	0	0	0	0	0	0	0	0	0
Total	174	184	167	177	7	7	10	9	5.17%	3.80%	5.98%	5.08%

This work gives an opportunity to further extend the present study to explore the possibility of utilizing the recorded parasite for biological control after standardization of rearing techniques in Kashmir valley.

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References

Achtergerg, C. V. 1979: A revision of the subfamily Zelinae Auct (Hymenoptera: Bracobnidae). Tijdschrift Voor Entomologie, 122 (7): 1-370.

Butani, D. K. and Jotwani, M.G. 1984. Insects in vegetables. India: Periodical Expert Book Agency, Delhi, India.

Capinera, J. L. 2001. Handbook of vegetable pests. USA: Academic Press, California.

Hassanein, F. A., Elheneidy, A. H., Abbas, M. S. T. and Hamed, A. R. 1985: Survey of the parasitoids of main lepidopterous pests in vegetable crop fields in Egypt. Bulletin de la societe entomologique d' Egypte, 65: 259-265.

Nair, M.R.G.K. 1970. Insects and mites of crops in India. New Jack Printing Works Private Limited.

Rao, R. S. N. and Satyanarayana, S. V. V. 1984. Note on more additions to the natural enemy complex of Spodoptera litura F. and *Myzus persicae* Sulz. on tobacco in Andhra Pradesh. Current Science, 53 (4): 201

Wharton, R. A., Marsh, P. M. and Sharkey, M. J. 1997. Manual of the new world genera of the family Braconidae (Hymenoptera). Washington, D. C: Special Publication. of the International Society of Hymeneopteretists,1: 1-439.